## Space Weather Forecast

Issued on Saturday, 30 April 2022 at 13:30 Local

**This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales**

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**Space Weather Forecast Headline: G1/Minor geomagnetic storm intervals possible in first half of forecast period, but low confidence. Gradually reducing chance of Moderate-class X-ray flares (R1/R2 Radio Blackouts).**

**Analysis of Space Weather Activity over past 24 hours**
**Solar Activity:** Solar activity has been Moderate, with three Moderate-class flares observed, all from a region which is beyond the northwest limb, but with any flares still in line of sight of Earth. Four sunspots are on the visible disc, two unipolar regions in the northwest, with a unipolar and simple bipolar region in the southeast. No Earth-directed CMEs (coronal mass ejections) have been observed in the last 24 hours.

**Solar Wind / Geomagnetic Activity:** The solar wind, observed at L1, has been steadily declining from elevated levels, but with brief jumps due to the passage of a CME in the last 18 hours. Total magnetic field strength was mainly weak, but increased to moderate levels briefly due to the CME, with the north-south component also reaching moderate levels for a time. Geomagnetic activity was mainly Quiet to Unsettled, but with a G1/Minor storm interval between 30/0300-0600UTC.

**Energetic Particles / Solar Radiation:** No solar radiation storms were observed in the 24 hours, although there was a limited proton response following a Moderate-class flare on 29th April from a now faded region, with a peak flux of 4.2pfu at 29/2145 UTC.

**Four-Day Space Weather Forecast Summary**
**Solar Activity:** Moderate activity is expected on 30th April, due to the continue effects of a sunspot region just beyond the limb, with any flares still in the Earth's line of sight. A return to Low activity is then forecast for the remainder of the period, but this may be modified by how current and returning regions develop.

**Solar Wind / Geomagnetic Activity:** There is the possibility of two CMEs arriving on 30th April, although the first of these appears to have already arrived at Earth. A further CME is considered most likely to glance the earth on 1st May. A fast wind is currently waning in influence, with speeds around 500km/s and continuing to fall. No further CMEs or fast winds are forecast at Earth during the forecast period. Geomagnetic activity is forecast to be Quiet to Unsettled on 30thn April and 1st May, with a slight chance of Active or G1/Minor Storm intervals due to any CME effects. Conditions should return to mainly Quiet conditions by 2nd and 3rd May.

**Energetic Particles / Solar Radiation:** Solar radiation should remain near background levels through the next four days. However, a faded sunspot region remains in the northwestern quadrant, and given its recent occasional flare activity remains a potential source for a proton event for the next few days, albeit with probabilities at a slight chance.

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Met Office

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**Geomagnetic Storms:**

| Geo-Magnetic Storm Probability (Exceedance) | Level | Past 24 Hours (Yes/No) | Day 1 (00-24 UTC) (%) | Day 2 (00-24 UTC) (%) | Day 3 (00-24 UTC) (%) | Day 4 (00-24 UTC) (%) |
|---|---|---|---|---|---|---|
| Minor or Moderate | G1 to G2 | No | 20 | 20 | 1 | 1 |
| Strong | G3 | No | 1 | 5 | 1 | 1 |
| Severe | G4 | No | 1 | 1 | 1 | 1 |
| Extreme | G5 | No | 1 | 1 | 1 | 1 |

**Radio Blackouts - X Ray Flares:**

| X Ray Flares Probability | Level | Past 24 Hours (Yes/No) | Day 1 (00-24 UTC) (%) | Day 2 (00-24 UTC) (%) | Day 3 (00-24 UTC) (%) | Day 4 (00-24 UTC) (%) |
|---|---|---|---|---|---|---|
| Active | R1-R2 M Class | Yes | 70 | 20 | 10 | 10 |
| Very Active | R3 to R5 X | No | 1 | 1 | 1 | 1 |

**Solar Radiation Storms - (High Energy Protons):**

| Radiation Storms Probability (Exceedance) | Level ($cm^{-2}$ $sr^{-1}$ $s^{-1}$) | Past 24 Hours (Yes/No) | Day 1 (00-24 UTC) (%) | Day 2 (00-24 UTC) (%) | Day 3 (00-24 UTC) (%) | Day 4 (00-24 UTC) (%) |
|---|---|---|---|---|---|---|
| Active | ≥ S1 | No | 5 | 5 | 2 | 2 |
| Very Active | ≥ S3 * | No | 1 | 1 | 1 | 1 |

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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